CLAIMS

1. An optical connector ferrule comprising:

a mating surface made of resin;

an optical fiber accommodating hole having an inner surface and one end portion, said inner surface extending along a predetermined axis and being made of the resin, and one end portion reaching said mating surface;

a first guide projection having proximal and distal end portions, said first guide projection continuously extending from said mating surface along the predetermined axis, and said first guide projection being made of the resin; and

a guide engaging portion continuously extending from said mating surface along the predetermined axis, said guide engaging portion made of the resin.

2. A ferrule according to claim 1, wherein said guide engaging portion includes a second guide projection having proximal and distal end portions, said second guide projection continuously extending from said mating surface along the predetermined axis, and said second guide projection being made of the resin.

3. A ferrule according to claim 2, wherein the proximal end portion of each of said first and second guide

projections has a cross-section area gradually increasing along the predetermined axis toward said mating surface.

4. A ferrule according to claim 2 or 3, wherein each of said first and second guide projections has a substantially circular cross-section.

5. A ferrule according to claim 1, wherein said guide engaging portion includes a guide hole having an opening portion, a distal end portion, and an inner surface, said opening portion being provided on said mating surface, said inner surface being made of the resin, and said guide hole extending along the predetermined axis.

6. A ferrule according to claim 5, wherein the inner surface of said guide hole includes a first tapered surface, said first tapered surface being provided on at least one of the distal end portion and opening portion of said guide hole, and said first tapered surface tilting along the predetermined axis.

7. A ferrule according to claim 5 or 6, wherein said guide hole has a substantially circular cross-section.

8. A ferrule according to any one of claims 5 to 7, wherein said first guide hole has a second tapered surface,

said second tapered surface being provided on at least one of the proximal and distal end portions, and said second tapered surface tilting along the predetermined axis.

9. A ferrule according to any one of claims 5 to 8, wherein the proximal end portion of said first guide projection has a cross-section gradually increasing along the predetermined axis toward said mating surface.

10. A ferrule according to claim 5, wherein the inner surface of said guide hole has a third tapered surface, said third tapered surface being provided on the opening portion of said guide hole, and said third tapered surface tilting along the predetermined axis;

said first guide projection has a fourth tapered surface, said fourth tapered surface being provided on the distal end portion of said first guide projection, and said fourth tapered surface tilting along the predetermined axis; and

a tilt angle of the third tapered surface is associated with that of the fourth tapered surface.

11. A ferrule according to any one of claims 5 to 10, wherein said first guide projection has a substantially circular cross-section.

12. A ferrule according to any one of claims 1 to 11, wherein the resin includes PPS resin containing 39 to 65 wt% of silica particle filler and 26 to 35 wt% of silicate whisker filler with a total content of the silica particle filler and silicate whisker filler being 65 to 85 wt%.

13. A ferrule according to any one of claims 1 to 12, wherein said optical fiber accommodating hole is provided between said first projection and said engaging portion.

14. A ferrule according to any one of claims 1 to 13, further comprising one or more additional optical fiber accommodating holes, each having an inner surface extending along the predetermined axis and being made of the resin.

15. A mold for providing said optical connector ferrule according to claim 1, comprising:

first, second, third, and fourth mold units for defining a cavity for providing said ferrule;

said first and second mold units, combined with each other to define the cavity, providing opening portions toward the predetermined axis so as to provide a housing portion for housing said third and fourth mold units;

said third and fourth mold units being housed in the housing portion so as to be movable along the predetermined axis with respect to said combined first and second mold

units; and

said third mold unit including a guide projection forming portion, at least one pin, and an engaging portion forming portion, said guide projection forming portion having an inner surface and a bottom surface and extending along the predetermined axis, said at least one pin extending along the predetermined axis, and said engaging portion forming portion being provided to form said engaging portion and extending along the predetermined axis.

16. A mold for providing said optical connector ferrule according to claim 2, comprising:

first, second, third, and fourth mold units for defining a cavity for providing said ferrule;

said first and second mold units, combined with each other to define the cavity, and providing opening portions toward the predetermined axis so as to provide a housing portion for housing said third and fourth mold units;

said third and fourth mold units being housed in the housing portion so as to be movable along the predetermined axis with respect to said combined first and second mold units; and

said third mold unit including a pair of guide projection forming portions and at least one pin, each guide projection forming portion extending along the

predetermined axis and having an inner surface and a bottom surface, and said at least one pin extending along the predetermined axis.

17. A mold for providing said optical connector ferrule according to claim 5, comprising:

first, second, third, and fourth mold units for defining a cavity for providing said ferrule;

said first and second mold units, combined with each other to define the cavity, providing opening portions toward the predetermined axis so as to provide a housing portion for housing said third and fourth mold units;

said third and fourth mold units being housed in the housing portion so as to be movable along the predetermined axis with respect to said combined first and second mold units; and

said third mold unit including a guide projection forming portion, a projection, and at least one pin, said guide projection forming portion having an inner surface and a bottom surface and extending along the predetermined axis, said projection having a side surface and extending along the predetermined axis, and said at least one pin extending along the predetermined axis.

18. A mold according to claim 15 ~~or 17,~~ wherein said third mold unit has a vent reaching a surface of said third

mold unit from at least one of a bottom surface and inner surface of the guide projection forming portion.

19. A mold according to claim 16, wherein said third mold unit has a vent extending from at least one of the bottom surface and inner surface of each guide projection forming portion to a surface of said third mold unit.

20. A mold according to ~~any one of claims 15 to 19~~ 15, wherein the pin of said third mold unit has a tapered distal end portion.

21. A mold according to claim 15 ~~or 17~~, wherein the inner surface and bottom portion of said guide projection forming portion have chromium nitride coatings.

22. A method of manufacturing an optical connector ferrule, comprising the steps of:

preparing said mold according to claim 15;

providing a molding resin into said mold to form said ferrule; and

inspecting a position of the fiber accommodating hole with respect to that of the first guide projection to screen said ferrule having passed the inspection and said ferrule having failed to pass the inspection.

23. A method of manufacturing an optical connector ferrule, comprising the steps of:

preparing said mold according to claim 16;

providing a molding resin into said mold to form said ferrule; and

inspecting a position of the fiber accommodating hole with respect to that of the first guide projection of said ferrule to screen said ferrule having passed the inspection and said ferrule having failed to pass the inspection.

24. A method of manufacturing an optical connector ferrule, comprising the steps of:

preparing said mold according to claim 17;

providing a molding resin into said mold to form said ferrule; and

inspecting a position of the fiber accommodating hole with respect to that of the first guide projection of said ferrule to screen said ferrule having passed the inspection and said ferrule having failed to pass the inspection.

25. A method of inspecting a position of a fiber accommodating hole of said optical connector ferrule according to claim 2 with respect to the first guide projection thereof, comprising the steps of:

preparing a jig having a pair of positioning holes provided such that the first and second guide projections

of said ferrule can be inserted therein;

receiving light passing through the pair of positioning holes of said jig to determine the positions of the positioning holes of said jig based on the received light;

inserting the first and second guide projections into the positioning holes;

receiving light passing through the fiber accommodating hole and determining positions of the fiber accommodating hole based on the received light; and

inspecting the position of the fiber accommodating hole with respect to the first and second guide projections based on the determined positions of the fiber accommodating hole and the positioning holes.

26. A method of inspecting a position of a fiber accommodating hole of said optical connector ferrule according to claim 5 with respect to the first guide projection thereof, comprising the steps of:

preparing a first jig having a pair of positioning holes provided such that the projections of said ferrule can be inserted therein;

receiving light passing through the pair of positioning holes of said jig to determine the positions of the positioning holes of said jig based on the received light;

preparing a second jig having a positioning projection provided so as to be inserted into the first guide hole of said ferrule to insert the positioning projection of said second jig into one of the pair of positioning holes;

inserting the first guide projection of said ferrule into the other of the pair of positioning holes, and inserting the positioning projection into the guide hole of said ferrule;

receiving light passing through the fiber accommodating hole to determine a position of the fiber accommodating hole based on the received light; and

inspecting the position of the fiber accommodating hole with respect to the first guide projection and the guide hole based on the determined positions of the positioning hole and the fiber accommodating hole.